

**Before the
FEDERAL COMMUNICATIONS COMMISSION
Washington, D.C. 20554**

In the Matter of)	
)	
Carrier Reports on Implementation)	CC Docket 94-102
Of Wireless E911 Phase II)	
Automatic Location Identification)	

**AT&T WIRELESS SERVICES, INC.
E911 PHASE II REPORT**

Pursuant to the Commission's Public Notice, released September 14, 2000, in the above-captioned proceeding, AT&T Wireless Services, Inc. ("AT&T") hereby submits its report on its plans for implementation of wireless E911 Phase II automatic location identification ("ALI") systems.

INTRODUCTION

AT&T has long been committed to enhancing the safety of its customers and the communities it serves. AT&T has played a prominent role in developing standards and policies for both Phase I and Phase II E911 service, and it maintains a long-standing commitment to cooperative partnership with the public safety community. AT&T was one of the first carriers to deploy Phase I service and it looks forward to providing consumers with Phase II ALI service that will enable PSAPs to find, identify, and assist them in times of need. Today, AT&T is working closely with location vendors to identify a Phase II solution that will fully satisfy the Commission's timetable and accuracy requirements. AT&T intends to continue these cooperative efforts and hopes to be able to identify in the very near future the technology that will bring Phase II E911 service to its subscribers in the shortest possible timeframe.

I. BACKGROUND/CONTACT INFORMATION

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II. E911 PHASE II LOCATION TECHNOLOGY INFORMATION

A. AT&T's Phase I E911 Efforts

AT&T has made a substantial investment to develop the requisite technology to meet the Commission's performance criteria for wireless E911 services in a timely manner. AT&T was one of the first carriers to deploy Phase I service, which, per the Commission's rules, is the necessary fall-back requirement in Phase II service, and it continues to work closely with PSAPs to deliver the benefits of Phase I service to increasing numbers of AT&T customers. Early in the process, AT&T hired an outside vendor with national expertise in 911 service delivery. It also created an internal E911 deployment team that includes technical, operations, finance, legal, policy and project management personnel. To ensure that Phase I service requests and inquiries from PSAPs are promptly acted upon, AT&T has developed an extensive database designed to track PSAP correspondence and ensure a timely response and the initiation of implementation activities. AT&T also is an active participant in the standard setting process for wireless E911 solutions (both Phase I and Phase II), with senior technical personnel playing a leadership role in the TR45.2 Ad Hoc on Emergency Services standards-setting body. AT&T has made a tremendous investment in PSAP outreach, including educational materials, membership in PSAP

community associations, and frequent participation in PSAP association conferences, in order to spur the deployment of E911 service.

AT&T has demonstrated its willingness to deploy any technically-feasible, standards compliant Phase I solution (NCAS, CAS, or hybrid) and is able to provide the Phase I E911 information to PSAPs in a format suitable for their use without the installation of additional equipment or upgrades.

Today, during the actual Phase I E911 deployment process, AT&T maps its service areas by cell site and PSAP location and, through a database query, identifies the PSAP to which to route 911 calls based on the cell site at which the call is originated. In jurisdictions without a cost recovery mechanism, AT&T deploys Phase I service without recovering its own costs. Despite low demand from PSAPs, approximately 1,300,000 (or ten percent of) AT&T customers will enjoy the benefits of Phase I E911 service by the end of next month.

B. Status of AT&T's Phase II Efforts

AT&T has devoted lengthy, focused efforts to the identification, investigation, analysis and testing of multiple potential location service providers. In keeping with its goal of identifying the best possible technology options for meeting customer needs, AT&T has investigated location service technologies of all types, including:

- Network-Overlay (including Time Difference of Arrival [TDOA], Angle of Arrival [AOA], and combinations of TDOA and AOA)
- Radio Frequency Pattern Matching
- Handset (including GPS Standalone, and GPS Assisted)
- Hybrid (including Enhanced-Observed Time Difference of Arrival [E-OTD])

In most cases in which AT&T has worked with location service providers to evaluate their technologies, it has agreed to non-disclosure agreements to maximize the cooperative spirit of the tests and trials conducted. These agreements limit the amount of detail that may be

included below.

1. Lockheed-Martin Analysis

In July 1999, AT&T contracted with Lockheed-Martin Corporation (“L-M”) to conduct a comprehensive assessment and analysis of all potential location service providers. L-M was selected for its depth of resources and technical expertise.

Over a four-month period, L-M evaluated the products/technologies being presented by fourteen different location technology vendors operating at that time. Those vendors are:

- KSI
- Grayson Wireless
- SigmaOne
- Cambridge Positioning
- SnapTrack
- IDC
- LMS Comm.net
- US Wireless
- True Position
- Navox
- Centraxx
- Harris
- Cell Loc
- Radix Technologies

L-M evaluated each vendor, including company background, future product and business plans, manufacturing capability, depth of staff and experience, and likely ability to support market trials. In addition, L-M analyzed each vendor’s technology, including strengths and weaknesses, product maturity, trials conducted, market discriminators, air interface support, performance in different environments, likely network impact, likely accuracy performance, support for roaming customers, and expected ability to support future network enhancements. L-M’s evaluation included bid reviews, vendor interviews, site/test environment tours, and trial analysis. The relative cost of each vendor’s technology was not included in this analysis.

In November 1999, L-M provided AT&T with a detailed evaluation of technologies. That document provided guidance to the AT&T Technology Development Group (TDG) ongoing work in reviewing potential location service technologies.

2. Internal AT&T Technology Review and Vendor Evaluation

For more than two years AT&T technical staff members (including senior engineers, project managers, and radio-frequency engineers) have been devoted to the analysis, evaluation and testing of various potential location technologies, as well as to the development of industry standards to allow the interoperability of those technologies when available. Some of those efforts are detailed below. Not reflected in the summaries below are the countless vendor meetings, technology conferences, and site visits AT&T team members conducted during 1999 and 2000 in pursuit of the best possible Phase II E-911 technologies.

3. Infrastructure Orders Placed

Regardless of the technology ultimately selected to provide Phase II location information, certain very substantial network upgrades will be necessary by wireless carriers to allow the Phase II information to be delivered reliably to PSAPs in a manner consistent with newly-adopted industry standards (J-STD-036 Emergency Service Protocol). These upgrades fall into three categories, for each of which AT&T has placed firm orders with vendors.

The categories and corresponding orders are:

- Wireless Mobile Switching Center (MSC) Upgrades: AT&T has placed orders for the appropriate new functionality (switching center software) with each of its three MSC vendors (Ericsson, Lucent, and Nortel).
- Mobile Positioning Center Development: AT&T has contracted with SignalSoft to provide an ANSI-41 and J-STD-036 standards-compliant Mobile Positioning Center (MPC). The MPC is a software hub between location determination technologies and mobile location applications, which allows carriers to interface with either handset-based or network-based technology, depending on their deployment strategies. The MPC platform will be operated by SCC Communications.

- Wireless ALI: AT&T has expanded and extended its contract with SCC Communications to secure the service delivery platform necessary to provide the ALI database component for Phase II service.

4. Redmond Location Technology Vendor Trials

During 1999 and 2000, AT&T conducted two trials of network-overlay location technologies, to which the company committed very substantial resources, time, and manpower. The results of these trials have been periodically reported in detail to the Commission's Wireless Telecommunications Bureau in a series of ex parte meetings with Bureau staff during the past 12 months.

The first trial was conducted in partnership with TruePosition, with testing designed to demonstrate the capabilities of that vendor's TDOA technology. TruePosition's equipment was deployed in seven AT&T base stations, and included both the AMPS and IS-136 TDMA air interfaces. More than 1,500 test calls were placed from stationary points, including indoor test locations, and were placed on standard commercially available handsets.

The second trial was conducted in partnership with Grayson Wireless, with testing designed to demonstrate the capabilities of that vendor's TDOA technology. As in the trial described above, Grayson's equipment was installed in seven AT&T base stations of their choice, and included both the AMPS and IS-136 TDMA air interfaces. More than 2,200 test calls were placed from stationary points and mobile routes, including indoor test locations and were placed on standard commercially available handsets.

Following completion of these two trials, and after analysis of the performance of both vendors' technologies, AT&T's technical team selected one vendor for participation in an expanded trial (see below).

5. Denver Location Technology Vendor Trial

Grayson Wireless was selected to participate with AT&T in an expanded Phase II trial in the Denver metropolitan area. The selection of Grayson was based largely on the availability of AOA antennas, which when used in conjunction with TDOA antennas, are expected to improve accuracy performance, particularly in rural areas. This trial is ongoing, with initial TDOA-only drive test results currently being generated.

When complete, the trial will involve the installation of Grayson equipment in 29 AT&T base stations, 25 with TDOA antennas and four with AOA antennas. Both AMPS and IS-136 TDMA air interfaces will be included, and test environments will include urban, suburban, rural, highway corridor, and indoor locations.

Although still ongoing, the expanded Denver trial has already yielded some important information for the AT&T team. Most significantly, the trial has demonstrated that there are substantial challenges associated with use of AOA antennas. AOA antennas are physically large in size (4' by 4' panels). These antennas represent substantial loading/capacity problems for some existing base stations, requiring removal and replacement of the support structure. Certain towers, particularly those on which multiple wireless carriers have collocated in order to reduce tower proliferation in communities, cannot accommodate additional large antennas. In addition, the size of AOA antennas has generated opposition and concern on the part of property owners (the landowners from whom AT&T rents land for its base stations) and zoning authorities. Typically AT&T's existing permits do not allow the installation of additional large antennas without securing new zoning approval (not guaranteed due to potential opposition) and the corresponding building permits.

To prepare for these challenges, AT&T conducted an exhaustive review of local zoning requirements and attempted (in cooperation with the vendor) to select sites for the AOA antennas

that would encounter minimal delay. Nevertheless, experience to date in the Denver trial has indicated that the zoning necessary for placement of AOA antennas typically requires five months (four months of zoning clearance and one month for securing the necessary building permit). Moreover, the uncertainty associated with landowner-related delays introduces additional challenges to timely deployment.

6. Seattle Location Technology Vendor Trial

Beginning Fourth Quarter 2000, AT&T will participate with US Wireless Corporation in a trial, based in the Seattle area, of the RadioCamera [TM] Location System. The goal of the trial will be to evaluate performance of the US Wireless technology in a realistic field test environment, representing a wide range of operating environments and test conditions. Testing will include a large number of test calls from both stationary points and mobile routes, and will be conducted for both the AMPS and IS-136 TDMA air interfaces.

7. Evaluation of Handset-Based Location Technologies

In addition to the network-overlay Phase II trials discussed above, AT&T has been actively investigating the capabilities of handset and handset-network hybrid location solutions. AT&T issued an RFI to its major handset vendors to obtain their input on potential handset-based solutions, and engaged in detailed follow up discussions with each vendor on a number of issues regarding the vendor's preferred handset-based location technology, including timing, model availability, network impacts, Third Generation (3G) wireless plans, and cost trends. In anticipation of handset-based solutions becoming available in the future, AT&T currently is working on air-interface standards for communicating handset-based location information to position-determination equipment. AT&T also continues to evaluate handset-network hybrid technologies, including their engineering design and performance modeling. It has ongoing

discussions with handset, network, and location-technology vendors, and is planning trials of at least one hybrid solution.

8. Cooperation with CTIA Multi-Carrier Technology Investigation

During 1999 and the early months of 2000, AT&T participated in a multi-carrier effort, led by the Cellular Telecommunications Industry Association (CTIA) with the goal of attempting to determine the potential economies of a collective Phase II E-911 solution for the wireless carriers operating in the Washington, D.C. metropolitan area.

9. AT&T Leadership in Industry Standards-Development Bodies

AT&T senior technical resources have played leadership roles for several years to assist in the development of robust, comprehensive standards to guide the development of Phase II E-911 systems. A senior member of AT&T's Technical Development Group has served for several years as the Vice-Chair of TR45.2 Ad-Hoc for Emergency Services (the standards group directly responsible for J-STD-036 and other E911 standards for the wireless industry), a group whose membership includes representation from NENA, APCO, various wireless carriers, and network infrastructure vendors.

10. Cooperation with National Public Safety Organizations

AT&T is very active in outreach and cooperation with national public safety organizations (NENA and APCO). In recognition of the cooperative effort that is a key to successful wireless E911 implementation, the company participates in both organizations' national conferences, as well as regional educational/training efforts for NENA and APCO membership.

CONCLUSION

AT&T will continue to pursue every possible avenue to find a Phase II solution that complies with the Commission's standards and will bring enhanced location service to the most AT&T customers as quickly as possible. In addition, it will work closely with vendors that are looking for ways to improve already tested systems. At this point, however, AT&T is not in a position to choose between a handset and network overlay solution. AT&T commits to file an amended report as soon as possible regarding its continuing efforts to find a compliant solution and its choice of Phase II ALI technology.

Respectfully submitted,

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